**Here is my suggestion for labs the biology class for 5-8th graders. The intent is to build understanding of plants from a cellular level to that of the whole organism.**

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| **Labs** | **Expected Outcomes** |
| Viewing prepared slides and personal cells | Proper use of a microscope  Create of a wet mount slide  Compare and contrast the general differences between animal and plant cells  Predict how form affects function for cells viewed |
| Plasmolysis of elodea or onion cells | Identify the 3 visible characteristics of a plant cell  Describe the impact of salt water on the plant cell  Describe the impact of distilled water on the plant cell  Generalize the concepts of diffusion and osmosis |
| Osmosis lab | Following a step by step procedure  Making a prediction  Testing a hypothesis  Properly identifying the roles of semipermeable membranes, osmosis and diffusion |
| Germination lab | Identify the three items needed for a plant to germinate  Accurately record and diagram radicle and plumule emergence and growth  Demonstrate phototropism and gravitropism |
| Imbibed seed lab | Identify the parts common to plant seeds  Identify the differences between monocots and dicots  Explain the importance of form and function for a variety of seeds |
| Elodea lab | Following a step by step procedure  Making a prediction  Recognize the inputs and outputs of photosynthesis |
| Construct a garden and plant/ tend to items within it |  |
| **Non-lab Activities** | **Expected Outcomes** |
| Biome project | Use maps and images to look at a natural system  Identify species, populations and communities  Compare / contrast the roles of organisms in relationships (predator/ prey, parasite /host, producer / consumer / decomposer)  Create/ analyze food webs and energy pyramids to look at energy transference  Explain limiting factors (biotic and abiotic)  Research a human impact (positive or negative) on the biome |
| Plant use | Identify the significance of a single plant species for both human and other organisms |
| Cell architecture | Create an analogous system for a cell and clearly identify the cellular item /organelle/ role being compared |

**Inquiry ideas:**

* Selective breeding (animals or plants), Heritage plants, Seed savers, GMOs
* Water issues (availability, conservation, pollution, as a trade commodity, inventions for H2O transport and cleansing, etc)
* Organic and sustainable agriculture (composting, natural pest control, erosion control, companion planting, etc)
* Issues affecting pollinators (ei: colony collapse disorder, wind turbines affecting bats, etc)
* Proposal of solutions to a problem resulting from humans obtaining and using a natural resource